

ABSTRACT

The invention is a system that was developed for medical imaging, with particular attention to breast imaging applications. Spot focused architecture enables very high resolution imaging using very large aperture transducer arrays, where depth of field and focal length cause a small focused spot at a pre-set depth for each transmit-receive operation.

Scanning depends on rapid movement of the focus spot throughout an intended object space, so transmit-receive events are overlapped in time. Coded signals are used to suppress interference caused by such overlap. Selection of codes by pre-set correlation is simple, where a correlator channel produces a single image data sample for each spot.

Coded signals are compensated for frequency dependent attenuation by the medium to enable wide bandwidth effects. Attenuation leveling and fixed paths to spots enable prediction and compensation for frequency dependent attenuation to enable broad band effects.

The architecture provides for bistatic operation of sparse arrays, with hybrid electronic beamformers. It also uses mechanical scanning. Transducer elements are constructed by cutting strips from thin cards of piezo-electric material.